

E21-006-01-US

**MICROWAVE DEMULSIFICATION OF HYDROCARBON  
EMULSION**

**ABSTRACT OF THE DISCLOSURE**

Recovery of hydrocarbons, such as petroleum products, from a liquid or solid substrate is facilitated by the use of microwave energy to energize and separate molecular bonds between the hydrocarbons and the substrate. A radio frequency (RF) applicator delivers microwave energy to a treatment volume containing an emulsion of a hydrocarbon and a substrate. Delivering the microwave energy to the emulsion facilitates separation of the hydrocarbon and substrate molecules into layers. Hydrocarbons and other products can then be recovered from their respective layers. The treatment volume may be located either above or below ground. The RF applicator may include an antenna body with slots formed substantially parallel to one another in a substantially horizontal orientation. The RF applicator efficiently delivers microwave energy into the treatment volume. Substantially all of the power supplied to the RF applicator is radiated, with very little power reflected internally within the RF applicator.